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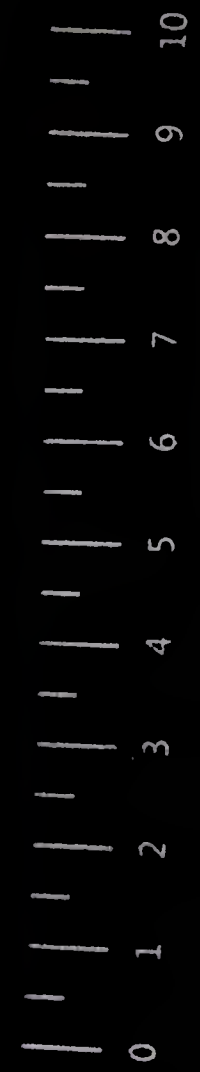

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BULLETIN

— OF THE —

British Columbia Entomological Society

EDITED BY R. V. HARVEY, M. A. VANCOUVER, B. C.

QUARTERLY JUNE, 1907 No. 6

NOTES OF BREEDING LEPIDOPTERA.

By J. W. Cockle, Kaslo, B. C.

Part 1—Eggs.

Many standard works have treated of breeding, but there is always scope for publication of facts which have come under the observation of individual collectors, and which may be of interest to others.

Breeders of insects are often confronted with little difficulties, which experience alone can overcome, and a record of such should prove of interest.

One of the first troubles that confronts the breeder is to secure ova from captive females;—in order to do this it is imperative to produce conditions similar to what the insect would find in its wild state, and some of the most striking which have come under observation may be mentioned.

The early-flying Geometers lay their eggs among the flower-buds of their food-plant, the young larvae in their initial stage feeding on the flowers, and when these fade they travel off to the adjacent leaves. A bunch of immature flower-buds introduced into the glass will often induce oviposition, when, if only the leaves are present the same insect will refuse to lay any eggs.

Another condition is found among the day-flying Sphingidae, which fly only in the heat of the sun. These insects when confined must be placed in direct sunlight, as they absolutely refuse to lay when placed even under a slight protective shade. I have confined Lepisesia and Hemaris in a glass cylinder placed in front of a plate-glass window, where the temperature would be over 120 degrees, and under these conditions they flew continuously and laid freely; but the passing of a thin vapoury cloud over the sun would cause them to settle immediately. As they, in common with most of the Sphingidae, oviposit only when on the wing, room must be provided for them to fly round easily. Direct sunlight must be provided to all moths which fly in the heat of the sun; Alypia, Albuna, and their allies are all subject to the same conditions.

Many moths which lay their eggs in the crevices of bark must be provided with cracks in the bark of their food-plant in which they can oviposit. **Erannis defoliaria** and probably many of the Catocalas and Synedas are among this group.

Those which lay their eggs in clusters round twigs, as in the case of **Pseudohazis shastaensis,** must be accommodated with the requisite twig and room.

The majority of the Noctuids and Bombycids will oviposit anywhere, and confining them in a glass jelly-tumbler is usually sufficient to ensure a batch of eggs, but when repeated trials fail in inducing them to lay, the breeder is confronted with the problem of inaugurating conditions similar to those which nature has decreed, and it is in such cases that the study of the habits of the insect and its natural environment may lead the student to a solution of the difficulty.

Another fact must be kept in mind, and that is to feed captive insects. The period of oviposition often lasts several days, and the moth in its natural state feeds between times. Food can be most readily provided by saturating a small ball of cotton in honey and water, which can be suspended by a string in the glass, or a piece of ripe fruit may be used for the same purpose.

Part 2 Will Deal With Food-plants and Feeding.

NOTES OF THE DISTRIBUTION OF INSECTS IN BRITISH COLUMBIA.

By R. V. Harvey.

Part III.

As I have already pointed out, the increase of warmth which marked the close of the Ice Age drove the exiled Arctic population back towards the North. But many individuals, indeed many entire species, found out that a cooler climate could be reached with much less trouble by an increase, not of latitude, but of altitude.

Accordingly many plants and insects spread slowly up the sides of the Rocky Mountains, driven upwards instead of northwards by constantly rising temperature and dryness of the plains below.

But at whatever height they found a congenial resting place, they would have to struggle for existence with the indigenous population, and many of them must have succumbed. Those, however, which have survived and propagated their kind into our own times, give us a remarkable proof of the truth of our theory of the dispersal of animals and plants as affected by the Glacial Period.

The most striking examples of this "stranding," as it is called, of species on mountain tops are found on the White Mountains of New Hampshire. Here many plants are identical with those of Labrador, but do not occur between the two places; while among the insects the distribution is most interesting and instructive. Dr. Scudder, in a paper published 1874, says: "In ascending Mt. Washington we pass, as it were, from New Hampshire to northern Labrador. On leaving the forests, we come first upon animals recalling those of the northern shores of the Gulf of St. Lawrence, and the coast of Labrador opposite Newfoundland; and when we have attained the summit we find insects which represent the fauna of Atlantic Labrador and the southern extremity of Greenland."

But there is another point about the insect fauna of Mt. Washington that is not so easily explained. It is now quite simple to find a reason for the resemblance between the insects of New Hampshire peaks and those of Labrador; but we must also find a reason for the fact that many Mt. Washington species are found either in Europe on the east, or in British Columbia in the extreme west, or in both these localities, without being found to any extent in the intervening country.

Let me take some concrete examples from the Order Diptera. In the family Syrphidae, as listed in Prof. Aldrich's catalogue of N. A. Diptera, there are, by my reckoning, forty-four species found on the White Mountains. Again, in the same list there are thirty-four European species given as found in North America. No less than twelve of the latter are found on Mt. Washington, while out of the whole sixty-six species from the two localities—Europe and White Mountains—forty-six, or 75 per cent., occur on the Pacific Coast. And it is to be borne in mind that very few indeed of these 46 are found right across the continent, as a glance at the catalogue will show. In the genus Syrphus, of eight species occuring on Mt. Washington, seven are British Columbia species, and the other is found in Alaska. Of our common Lasiophthicus pyrastri Baron von Osten Sacken said, in 1877: "It has never been found east of the Mississippi. The question how it got to these (western) regions is an interesting problem."

The species in question is found in Europe and the Pacific States.

In the same paper, entitled "Western Diptera," the author has some interesting remarks on resemblances between the Western fauna and the fauna of Northern and Central Europe, the species being foreign to the fauna of the Eastern United States, and, to quote his own words, "they are the more strange, as, far from being favored by any similitude of meteoric or botanic conditions, they seem to exist in spite of differences in these conditions. He is here speaking of California, whereas in British Columbia, the metoric and botanic conditions are assuredly similar in a marked degree to those of Europe. I append some examples given by Osten Sacken, and a few which have come under my own notice:—

LEPIDOPTERA.

Genus **Parnassius:** Sweden, Alps, British Columbia and Rockies (not east of Mississippi).

Papilio machaon: Europe, almost same as P. zolicaon, British Columbia and California.

Brenthis chariclea: Lapland, Greenland, Labrador, British Columbia mountains.

Brenthis freija: Siberia, Norway, Labrador, British Columbia mountains.

Pamphila mandan: Europe, White Mountains, British Columbia.

Plusia gamma: Europe, nearly same as P. californica of the west coast.

Anarta melanopa: Europe, Arctic America, British Columbia mountains.

Carsia paludata: Europe, Arctic America, British Columbia mountains.

Mesoleuca silaceata: Europe, Montana, British Columbia.

DIPTERA.

Genus **Silvius (Tabanidae):** Europe, Western States (not east of Mississippi).

Genus **Elliptera (Tipulidae):** Europe, California (not eastern).

NEUROPTERA.

Genus **Rhaphidia:** Europe, California (not in Atlantic States).

ORTHOPTERA.

Genus **Locusta:** Europe, Western region (not in Atlantic States).

(To be concluded.)

CORRESPONDENCE.

Central Experimental Farm, Ottawa, April 25, 1907.

Dear Mr. Harvey:—

I have just received your most interesting Quarterly, Part No. 5, and have read with much pleasure your notes on the distribution of insects in British Columbia. I am moved, however, to write to you in reference to a statement in your second line, viz.: that your members "will doubtless now have their setting boards in full swing."

Now as a matter of fact I wonder if your members do really swing their setting boards, or know what an excellent plan that is to keep off the attacks of some of the entomologists' worst enemies, museum pests and mice, while specimens are drying on the boards? Mr. Arthur Gibson, my assistant, taught me one of the best "dodges" I know of for this purpose, and it simply consists of screwing into one end of your setting boards a little hook by which the board, when covered with mounted specimens, may be hung up against the wall out of the way of harm by the above pests and many accidents. The details of how the board is hung, or what it is hung to, may of course be changed according to convenience, but the main idea that they should be swung up out of the way I have found of very great value, and think possibly it may also be a suggestion which will be acceptable to some of your readers. With kindest regards,

Yours very truly,

JAMES FLETCHER.

Smithsonian Institute, United States National Museum.
Washington, D. C., April 29, 1907.

My Dear Sir:—

I noted the remarks on Xylomiges by you in the Bull. B. C. Ent. Soc., which you kindly sent me, and am stimulated to send you some notes on them, which you are at liberty to publish if you should care to.

Sir George Hampson has lately (1905) classified these species under the new genus **Xylomania**, proposed by him. He makes four divisions, as follows:

1. Male Antennae, pectinate, including the species **behrensiana, erythrolita** and **hiemalis.**
2. Male Antennae, with short branches, tip simple. Species: **pallidior, peritalis** and **cognata.**
3. Male Antennae, serrate fasciculate. Species: **rubrica, simplex, indurata, curialis, candida, dolosa** and **perlubens.**
4. Male Antennae, ciliated. Species: **pulehella, alternane** and **patalis.**

Now there appear to be two errors in this (excluding **peritalis** and **alternans,** of which I have no specimens), namely **rubrica** and **simplex. Rubrica** has the antennae ciliate, and should fall with **pulchella,** as you rightly place it. The two are probably varieties of one species. Hampson's error was probably due to his having only female specimens before him in this case. **Simplex** has the antennae with short branches, and should fall with **pallidior.** How Hampson came to place it as he did I cannot see, since he figures the male antennae showing the short branches. The structure is peculiar, the pectinations being on one side only, the other side being serrate fasciculate; but the same structure obtains in **pallidior** and **cognata,** so it ought not to have caused trouble.

The B. C. species should be listed as follows:

Genus, **Xylomania Hampson.**

1. **hiemalis Grote.**
2. **simplex Walker, pallidior Smith, cognata Smith.**
3. **caudida Smith, dolosa Grote, perlubens Grote.**
4. **rubrica Harvey, pulchella Smith, patalis Grote.**

I wish some one of your Society would raise and compare the larvae of these species. Eggs could be obtained in spring, and the larvae easily fed, no doubt.

Very truly yours,

Harrison G. Dyar.

THE BRITISH COLUMBIA LIST

Coleoptera. Family **Cerambycidae.**

The "Long-horns" are remarkably well represeuted in this Province probably exceeding in number of species any other family of our beetles. This is accounted for by the fact that the larvae are most all wood-borers; they live chiefly in the heart-wood, few of them boring in the sap-wood of living trees. Though very destructive to shade-trees in the East, few of our species can be classed as serious pests. The Western species seem to be very distinct from the Eastern, as is evidenced by the fact that of all the species recorded in this list only four are recorded in New Jersey lists. (The numbers are from Henshaw's List).

Ergates Serv.
5950 spiculatus Lec. ..... Wellington, Vancouver, Vernon

Prionus Geoff.
5961 californicus Mots ..... Victoria

Tragosoma Serv.
5967 harrisii Lec. ..... Vernon

Asemum Esch.
5970 atrum Esch ..... Island; Lower Mainland; Queen Charlotte Island

Nothorhina Redt.
5973 aspera Lec. ..... British Columbia

Criocephalus Muls.
5974 productus Lec. ..... Victoria, Vancouver
5976 asperatus Lec. ..... Victoria, Vancouver
5979 nubilus Lec.

Tethropium Kby.
5981 velutinum Lec. ..... Wellington; Vancouver
5982 cinnamopterum Kby ..... Wellington

Opsimus Thom.
5983 quadrilineatus Mann ..... Victoria, Queen Charlotte Island

Hyloptrupes Serv.
5992 ligneus Fab. ..... Island, Lower Mainland, Vernon

Phymatodes Muls.
5995 thoracicus Muls ..... British Columbia
6002 dimidiatus Kby. ..... Harrison River
6003 vulneratus Lec.
6005 decussatus Lec. ..... Victoria
6006 nitidus Lec. ..... Victoria, Wellington

Merium Kby.
6007 proteus Kby.

Callidium Fab.
6009 janthinum Lec. ..... British Columbia
6013 vile Lec. ..... Victoria

Eumichthvs Lec.
6089 oedipus Lec. ..... Wellington

Molorchus Fab.
6099 longicollis Lec. ..... Wellington

Rosalia Serv.
6113 funebris Mots ..... Island; Lower Mainland

Callichroma Latr.
6117 melancholicum Chev ..... Victoria

Clytus Laich.
6117 marginicolils Lap ..... Wellington

Xylotrechus Chev.
6183 undulatus Say ..... Island; Lower Mainland; Vernon
6184 annosus Say ..... Harrison River; Vernon
6189 planifrons Les ..... Wellington
6185 nauticus Mann ..... .
6190 obliteratus Lec. ..... Victoria, Wellington

Neoclytus Thom.
6197 conjunctus Lec. ..... "B. C."

Clytanthus Thom.
6207 ruricola Oliv ..... "B. C."

Atimia Hald.
6219 dorsalis Lec. ..... Vancouver

Desmocerus Serv.
6223 cribripennis Horn ..... Harrison R., Vancouver, Chilliwack

Necydalis Linn.
laevicollis Les. ..... Victoria, Wellington, Vancouver

Pyrotrichus Lec.
6229 vitticollis Lec. ..... Victoria

Leptalia Lec.
6230 macilenta Mann ..... "B. C."

Rhagium Fab.
6232 lineatum Oliv. ..... Wellington; Lower Mainland; Queen Charlotte Is.

Toxotus Serv.
6239 flavolineatus Lec. ..... Shawnigan, Hope Mts.
6240 vettiger Rond ..... Vancouver(?)
6244 vestitus Hald ..... Victoria, Goldstream
6246 obtusus Lec. ..... Vernon

Pachyta Serv.
6247 monticola Rond.
6248 liturata Kby.
6249 armata Lec. ..... Mt. Crown; Mt. Cheam; Hope Mts.
6251 spurca Lec. ..... Victoria

Anthophilax Lec.
6255 mirificus Bland ..... Vernon

Acmaeops Lec.
6260 atra Lec ..... Vernon
6266 subpilosa ..... Vernon
6267 longicornis Kby. ..... Vernon
6269 ligata Lec. ..... Vernon
6274 pratensis Laich..... Victoria; Hope Mts.; Sililkameen; Vernon

Gaurotes Lec.
6278 cressoni Bland ..... Harrison River; Vernon

Leptura, Serv.
6299 obliterata Hald ..... Generally distributed
6300 soror Lec ..... Victoria
6301 propinqua Bland ..... Victoria
6316 subargentata Kby. ..... Victoria, Hope Mts.
6318 laeta Lec ..... Victoria
6323 instabilis Hald ..... Hope Mts., Similkameen
a convexa Lec ..... Vernon
6324 sexmaculata Linn ..... Similkameen
6327 matthewsi ..... Vernon
6332 canadensis Fab..... Victoria, Vernon
var. a. erythroptera Kby ..... Victoria, Vernon, New Westminster
var. b. cribripennis Lec ..... Vancouver Island
6336 dehiscens Lec ..... Wellington, Vancouver, Hope Mts.
6337 sanguinea Lec ..... Vancouver Island, Vernon
6338 laetifica Lec ..... Victoria, Wellington, etc.
6339 hirtella Lec ..... Vernon
6340 quadrillum Lec ..... Victoria, Goldstream, Vancouver
6341 chrysocoma Kby ..... Generally distributed
6344 proxima Say ..... "B. C."
6346 dolorsa Lec ..... Generally distributed
6348 crassipes Lec ..... Generally distributed
6349 tibialis Lec..... Queen Charlotte Is., Cheam, Hope Mts.
6350 behrensii Lec ..... "B. C."
6351 octonotata Say ..... "B. C."
6353 vittata Germ ..... "B. C."
6356 vibex Newn ..... "B. C."
6358 scripta Lec..... Victoria, Wellington, Vernon, Hope Mts.
6360 valida Lec ..... Chilliwack
6363 aspera Lec ..... Wellington, Vernon, Similkameen
serpentina Cas ..... Shawnigan, Similkameen

Plectrura Mann.
6367 spinicauda Mann ..... Queen Charlotte Is., Victoria

Monohammus Serv.
6386 maculosus Hald ..... Victoria
6387 scutellatus Say..... Generally distributed
6388 confusor Kby ..... "B. C."

Synaphoeta Thom.
6403 guexi Lec ..... Victoria

Acanthocinus Steph.
6446 obliquus Lec. ..... Wellington, New Westminster
6447 spectabilis Lec ..... New Westminster

Pogonocherus Latr.
6453 mixtus Hald ..... Vancouver Island

Saperda Fab.
6478 calcarata Say ..... Vancouver Island
var. a. adspersa Lec..... Victoria
6483 vestita Say ..... "B. C."
6485 tridentata Oliv ..... "B. C."
6488 moesta Lec ..... Harrison

Oberea Muls.
6497 quadicallosa Lec ..... Wellington, Sicamous

Tetrops Steph.
6508 monostigma Hald ..... "B. C."

Tetraopes Serv.
6511 tetraophthalmus Forst ..... "B. C."
6513 femoratus Lec ..... "B. C."
var. c. oregonensis Lec ..... Vernon, Kamloops

ADDITIONAL NEUROPTEROID INSECTS

The following species were recently determined for Mr. Harvey by the kindness of Professor Nathan Banks. Most of them are new to our list.

Order Plecoptera. Family Perlidae.
Perla ebria Hagen ..... Nicolum River, July, 1906
Perlodes signata Hagen ..... Quamichan Lake, April, 1907
Pteronarcys californica Newp ..... Vancouver, 1906

Order Trichoptera. Family Phryganeidae.
Neuronia concatenata Walk ..... Quamichan Lake

Family Limnephilidae.
Homophylax flavipennis Banks ..... Nicolum River, July, 1906
Chilostigma alascensis Banks ..... Vancouver, March, 1907
Glyphopsyche bryanti Banks ..... Victoria, April, 1907

Order Neuroptera. Family Rhaphidiidae.
Rhaphidia oblita Hagen ..... Hope Mts., July, 1906

(Family not stated).
Acroneuria pacifica Banks ..... Nicolum River, July, 1906
Arsapnia grandis Banks ..... Vancouver, April, 1907

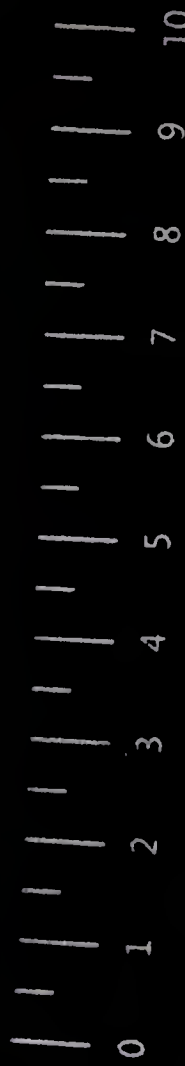
ADDITIONAL SPECIES OF LEPIDOPTERA

(Dyar's number).

1345 Oncocnemis glennyi Grt ..... Vernon (Bush)
1477 Noctua esurialis Grt ..... Vancouver (Bush), July 20
1560 Pronoctua typica Smith ..... Kaslo, Sept. 9 (Cockle)
1697 Paragrotis dissona Moschl ..... Field, July 25 (Bush)
1721 Paragrotis furtivus Smith ..... Vancouver, July 11 (Bush)
Fishia exhilarata Smith ..... Kaslo, Oct. 10 (Cockle)
Gortyna pallescens Smith ..... Kaslo, Aug. 25 (Cockle)
2781 Syneda graphica Hubn ..... Hope Mts., July 17 (Harvey)
5298 Carpocapsa toreuta Grt ..... "Interior of B. C." (J. R. Anderson)

The following Micro-lepidoptera were named for Mr. E. P. Venables by the kindness of Mr. W. D. Kearfott.

4454 Pyrausta insequalis Guen ..... Vernon (Venables)
4962 Pterophorus homodactylus Walk ..... ib. id.
Clethreutes galaxana Kearf ..... ib. id. (Metatype)
5524 Choreutis sliphiella Grt (var.) ..... ib. id.
Laspeyresia prosperana Kearf ..... ib. id. (Metatype)
5897 Ethmia albistrigella Wism ..... ib. id.



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